

Personal Information

Black n' Red™

Name

Dale Johnson

Dates of use

Evaporation Rate Study Notes

If found please contact

Guide to book contents

Important contact details

Use this page as a quick reference to the book's contents during use and for archiving purposes

www.BlacknRed.com



A John Dickinson product

EPI00091

5/29/09

Mix of 20 ml of similar mixture to original LW w/ raffinate

Start 20 ml total qty

12% oil leave 17.6 ml of solvent

5% benzene = 1 ml \Rightarrow 16.6 ml of solvent less benzene

1 ml benzene	100	1.50 factor
2.4 ml oil	67	15% Toluene
2.5 ml Tol		12% Ethyl benzene
2.0 ml Ethyl benzene		6% p-xylene
1.0 ml p-xylene		16% m-xylene
2.7 ml m-xylene		3% o-xylene
0.5 ml o-xylene delete		30% cyclohexane
5 ml cyclohexane		14% methylcyclohexane
2 ml methylcyclohexane		
20.10 ml in mixture		

2:44	5 sec pour	77.0°F liquid
		78.5°F plate
2:45		77.5°F liquid
		77.0 Air temp
2:46		76.5 liq / 78.5 plate
2:47	75.5°F liq	78.5 plate
2:48	75.0 liq	78.0 "

	<u>LID</u>	<u>GLASS</u>
2:49	74.5	78.5
2:50	74	78.5
2:51	73.5	78.5
2:52	73.5	78.0
2:54	73.5	78.5
2:55	73.5	78.5
2:58	73.5	78.0
3:04	73.5	77.5
3:11	74.5	77.5

Observation after solvents evaporated - oil left a sheen on the glass in the pattern of the original liquid spread. This will make quantifying surface area difficult after initial pour.

6/8/09 Velocity Verification

~~Up~~ stream

air velocity 2' x 2' duct

1	26	27	31	28
2	30	34	32	27
3	24	34	31	23
4	13	30	25	20

air volume

6.5	6.75	7.75	7.0
7.5	8.5	8.0	6.75
6	8.5	7.75	5.75
3.25	7.5	6.25	5.0

= 108.75
cfm

D C B A

Down

~~Up~~ stream

9.5" x 8.5" duct

1	205	220	215
2	220	225	220
3	200	210	205

11.42	12.26	11.99
12.26	12.59	12.26
11.15	11.57	11.42

107.01

cfm

C B A

Dial in

3	23	30	31	30
4	24	28	29	30

28

29 30 30

248-344-1770 ask Jeff Cooper
Tim Fields

Bureau Veritas Lab results on bulk liquid 6/8/09

GC-FID

cyclohexane 197,000 mg/kg

benzene 42,800 mg/kg

density .777

toluene 100,000 mg/kg

By mass benzene

Ref 668.1 ml \times .777 g/ml = 519.1 g

Oct 80.0 ml \times .863 g/ml = 69.0 g
588.1 g

31.9 ml \times .929 g/ml

6/8/09

Final mix for original LW formulation

Lab analysis - previous page 30 ml mix		New mix
Benzene	3.5 ml 3.5 ml	31.9 ml
Toluene	8.3 ml	55.3 ml
Ethyl benzene	8.0 ml	53.3 ml
p-xylene	4.0 ml	27.7 ml
m-xylene	11.0 ml	72.3 ml
o-xylene	2.0 ml	13.3 ml
cyclohexane	20.0 ml	133.3 ml
methyl cyclohexane	12.0 ml	80.0 ml
raffinate from P	30 ml	200 ml
multiplied values by $\frac{300}{30}$		668.1 ml 668.1 ml
$668.1 \text{ ml} \times 0.777 \text{ g/ml} = 519.1 \text{ g}$		+ 81.0 ml oil
		749.1 ml

88% of ~~raffinate~~ mix is raffinate

$$\frac{519.1 \text{ g}}{.88} = 589.9 \text{ g}$$

$$589.9 \text{ g} - 519.1 \text{ g} = 70.8 \text{ g oil / actual added } 69.9 \text{ g}$$

$$\text{Benzene by volume } \frac{31.9 \text{ ml}}{749.1 \text{ ml}} \times 100 = 4.27\%$$

6/8/09

Mixed raffinate w/ oil for 7 minutes

Filled 14 - 40 ml ^{glass} vials with exactly 20 ml of LWusing 20 ml calibrated pipette. Held in teflon/silicon ^{seal}

Balance of liquid wrench formula - poured into 2 liter glass jar.

Labeled bottles

"Liquid Wrench Reform"

Returned ~~to~~ to office - placed all mixed chemical products in refrigerator.

6/9/09 tested Wintex in dust on glass white sampling.

No interferences on ChemSense 600 data collection.

6/9/09 mixed up test treats in vials

Benzene (2ml), toluene (2.5ml)

Ethyl benzene (2.0ml), p-xylene (1.0ml), m-xylene (2.7ml)

Toluene (2.5ml), Ethyl benzene (2.0ml), p-xylene (1.0ml), m-xylene (2.7ml)

cyclohexane (5.0ml), methyl cyclohexane (3 ml), oil (2.4ml)

6/9/09 - Sent 300 ml of LW reform to Pennman & Brown for analysis of liquid initial boiling point, flash point closed cup, and specific gravity.

6/9/09 - Sent 20 ml of LW reform to Pennman Venetec for analysis of primary compounds in liquid in weight percentage.

6/10/09 Conducting a mass balance run for benzene using mixture of: ethyl benzene (70ml)
m-xylene (90ml)
benzene (50ml)

Flow rate:	31	31	26	22	1	Avg 29.5 fpm
(ft/min)	28	31	32	32	2	29.5 fpm x 4 ft ² =
	34	34	33	33	3	118 ft ² /min
	28	28	24	25	4	
	D	C	B	A		

$$5 \text{ ml} \times 879 \text{ g/ml} = 4.395 \text{ g} \times \frac{1000 \text{ mg}}{\text{g}} = 4395 \text{ mg}$$

4173 mg measured on ChemSense 600

$$\frac{4173 \text{ mg}}{4395 \text{ mg}} \times 100 = 95\% \text{ capture (slight residue)}$$

6/11/09 Mixed up 1ml benzene
19ml cyclohexane

11	23	19	11	1
32	31	31	10	2
33	30	29	32	3
36	34	29	25	4
D	C	B	A	

25.94

6/11/09

Mixed up 3ml cyclohexane 1:1
3ml benzene

15	18	16	17	1	Adm ran split
27	31	32	21	2	26.19 pag - one side measures
33	29	28	32	3	only 77-71, other all
31	30	25	34	4	hydrocarbons.
D	C	B	A		

Mixed up 6ml cyclohexane 3:1
2ml benzene

6/10/09

mixed up 9 ml cyclohexane 9:1
1 ml benzene

6/14/09

6 ml benzene

3 ml cyclohexane

31	25	21	21	1
30	30	29	29	2
21	30	31	22	3
31	30	32	22	4

27.2

D C B A

6/12/09

19.5 ml cyclohexane

0.5 ml benzene

22	27	26	18
29	28	25	25
31	31	30	13
14	29	30	23

25.1

End of oil reading is sufficient to quantify benzene in oil
Tom Fields 248-344-1762
EPA 8260

7/1/09

Removed the three 40ml vials of residual oil that was scraped from the glass plate from the refrigerator where they had been stored.

These vials contained the remaining oil on the glass plate after completion of the evaporation trial.

They were packed in blue ice inside a styrofoam cooler with a 1" insulation foam board fitted tightly across the top of the cooler & taped in place.

The vials were shipped to EMSL in N.J. overnight for delivery next day by 10:30 am.

Personal Information

Black n' Red

Name:

Adam Keil

Dates of use

5/27/2009 -

If found please contact

adkeil@gmail.com

Guide to book contents

Griffith chemSense setup, calibration,
+ use for measurement of gas phase
benzene during benzene
evaporation rate study

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EPI00103

5/27

Unrated 600 (chemSense)

- no damage
- included unit + power cord

Powered up

- AC booted fine
- no toluene cal. gas
warning when starting
GSS (won't use it anyway,
likely)
- installed cal. gas anyway
for initial tune

Unpacked benzene cal. + dilutant
air cylinders

221 L air

103 L benzene, 5ppm in air

data file 40 - 2 min direct leak
room air blank
biggest m/z 78 peak at
ca. 100 counts

data file 41 room air blank for sorbent
tubes

seems to be some high m/z noise. L
both files, will likely subside
as unit pumps down

file 42 room air blanks, m/z
50-150 w/ 2 tubes

attached heat tape to sintered
stainless inlet - set controller
to $\sim 20 \pm 2^\circ\text{C}$

file 43 - 2 tube method
w/ heat tape @ $\sim 75^{\circ}\text{C}$
- no apparent benzene
coming off filter.

backed heat tape controller
down to 15%

file 44 2 min direct leak
w/ sintered stainless filter
at $\sim 85^{\circ}\text{C}$

backed heat tape to $\sim 10\%$

file 45 is 2 min DL
filter @ 91°C

heat tape to $\sim 8\%$ ~~for~~ ^{AK}

needle valve / regulator combinations
 seem to work well
 can control dilution +
 air from 3 L / min. L to
 100 mL / min w/ needle
 valve w/ regulator set to
 3 L / min ...

air cyl. reg. set to 6.9 L / min.
 needle valve all the way open
 500 mL 22.225

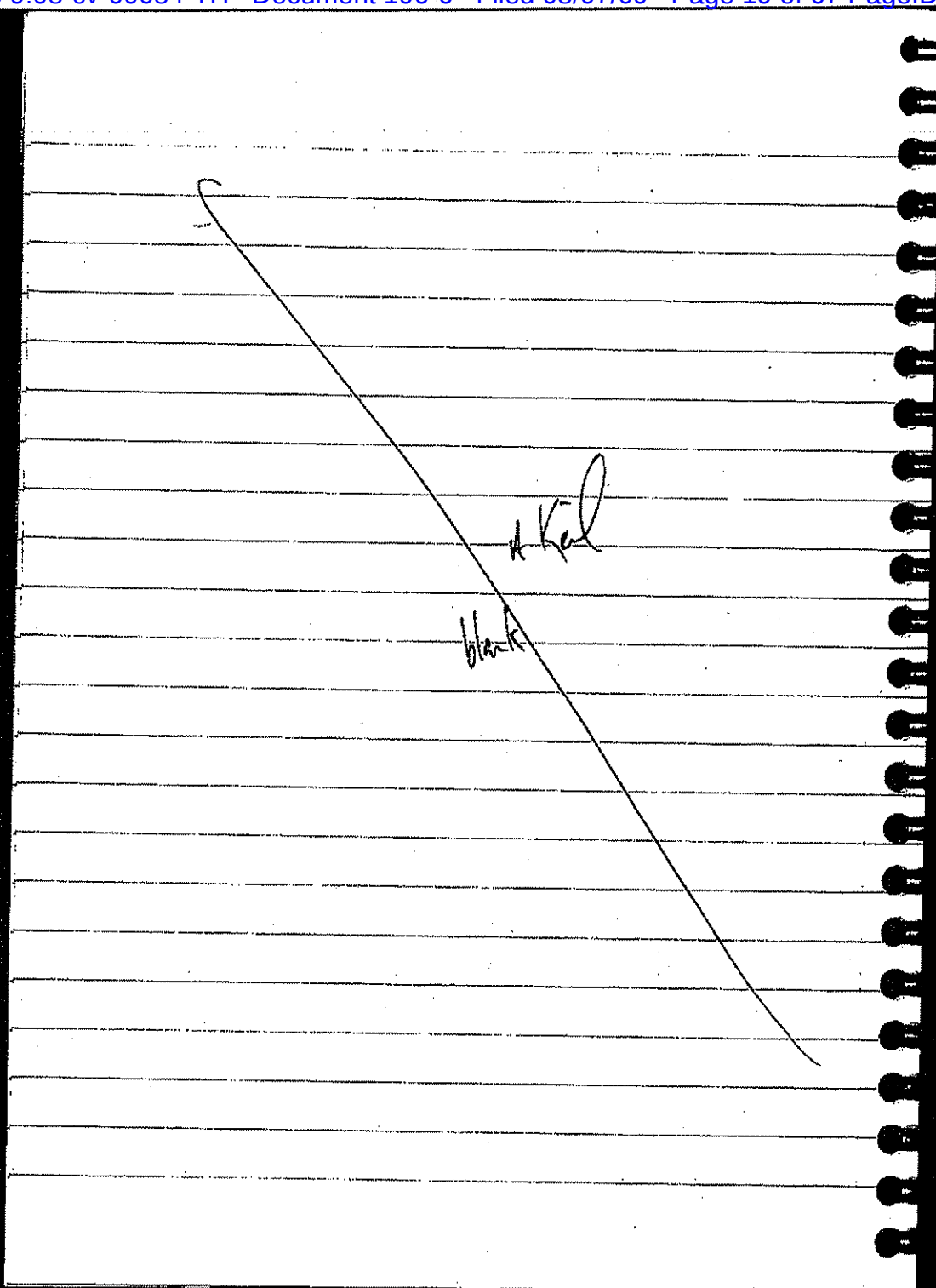
file 46 2 min DL (50-425)
 d.t. air cyl.

file 47 tube method (50-425)
 d.t. air cyl.

aha! am using tubing I ~~per~~ had
 prev. run 5 ppm benzene
 where... do I see it?

file 48 6 min DL run
 - first 2 min, sucking
 from vent (benzene
 cyl. OFF)
 after 2 min, turned on benzene
 (0.9 L/min)
 @ 4 min, turned off benzene
 cyl.
 @ 4.2 min, unhooked benzene
 line from T
 @ 4.6 min, plugged opening "L" T
 w/ finger
 @ 5.1 min, removed finger

file 49 DL method 50-150
 1.6 min, connected flowmeter
 benzene line to T
 w/ 28 sec left, disconnected T



EPI00109

AK
5/29 5/28

file 50 6mL DL 50-150
room air blank

file 51 6mL DL 50-150
flow box blank

sintered
stainless
heater
coil

file 52 6mL DL 50-150
flow box blank
hot inlet filter ~90°C

file 53 6mL DL room air
hot inlet

file 54 single tube, 30 s sample T2
room air blank

file 55 same as 54, but tube 1 (T1)

file 56 2 tubes
dual alt tubes method
room air blank

AKil

5/29 5/28 AK

files 57, 58, 59, 60

dual alt tubes, methyl
repeated 4 times,
room air

61 - DL, 6 mL

room air until ^{AK} until

2.0 mL, when I conn. 5 ppm benzene
to the T

@ 4.0 mL, dis conn. the benzene

file 62 MS only, detailed data,
DL no baseline subtr.

room air until 2.5 mL,

when I attached 5 ppm benzene to T
removed @ 4.0 mL

dilutant air cyl.

0.5 Lpm setting, needle valve wide

open, gives 500 mL in 27.34, 27.66,

27.52 s

AKail

AK
5/29 5/28

0.9 LPM setting gives 500 mL
16.91s, 16.54s, 16.60s

0.3 LPM setting
500 mL 45.71s, 44.82, 45.34

5 ppm benzene cyl.

0.3 LPM setting

needle wide open

500 mL in 45.38s, 45.28, 45.51

needle 2 turns open

500 mL in 47.58

$\frac{1}{2}$ turn open - 500 mL 122.88s

10 mL in 4.53s, 4.63s, 4.56s

all these 500 mL times are to the 500 mL
label, not the real mark so need
to be consistent there, real volume
displaced is ~250 mL, but if
consistent for both gas streams I'm
ok.

AKed

5/28

file 63 DL, 2 mL

1.346 ppm benzene

122.07 mL/min 5 ppm benzene

331.2 mL/min ^{AK} air

file 64 DL, 2 mL

0.597 ppm benzene

122.07 mL/min benzene

899.28 mL/min air

^{AK}
file ~~65~~, 66, 67, 68, 700.597 ppm benzene, as above
using dual alt tube method

file 65 does not exist

file 70 2 mL DL blank
cyl. air

file 71 2 mL DL

2.49 ppm benzene

330 mL/min 5 ppm benzene

331 mL/min air

AKel

5/28

72-75 2mL DL

cyl. blank

76-79 0.54607 ppm benzene

2 tube alt. method

110.4 mL/min benzene

899.28 mL/min air

80-83

0.8416 ppm

2 tube alt method

110.4 mL/min benzene

545.45 mL/min air

84-87

1.2499 ppm

2 tube alt method

110.4 mL/min benzene

331 mL/min air

AKail

AK 5/28
88-91 99

2 tube
cyl. blanks

100-111

2 tube
cyl. blanks

112-115

2 tube
5 ppm benzene

116-135 2 tube

room air blanks

136-145 2 tube blanks

146 DL 2 mL

room air blank

147 DL room air blank

AKel

"flow apparatus" = GBTEC

5/28

148

4-min DL

sampling 'blank' flow

apparatus prior to ^{AK} AK

Ethyl benzene, toluene, xylene mixture.

- little bit of toluene (maybe 91) .L

this one - is it my inlet manifold
somehow?

- this was prior to putting it the
large glass slide

149

30 min DL run

^{AK} ~~AK~~ "flow apparatus" of ^{AK} AK

sampling from - a mixture of toluene,

ethyl benzene, and xylene

(generally equal parts, maybe a bit
more toluene) 25 mL total

~12 mL toluene, 7-8 mL of others
spotted on to large glass plate

150

60 min DL of same sample

as 149, directly (or in 2 minutes)

after 149

removed inlet from GBTEC @ ^{AK} ~~ca.~~ ca. 12 min.

5/29

Swagelok part nos.

SS 1/4" nut

925-402-1 (1)

set of ten, SS ferrule pairs, 1/4"

S-400 - SET

GR

set nut + ferrule set, they run
multiples of 5

AK

AK

5/30 5/29

file

082654-1 is 2mL DL

room atm blank

some slight signal for toluene, still

is it the PFA inlet line?

this is w/o filter heater on

turned inlet heater on, shooting for 90°C

file 2 room atm blank DL

w/ filter heater hot (90°C)

file 3 DL 2mL

position 2B (middle) in the

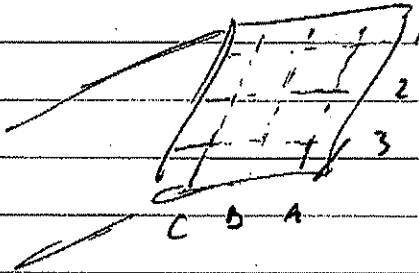
GBTEC BLANK (no solvent poured)

for the test, I'll pour ethyl benzene into a
plate (to get constant surface area) + measure
signal of ~~at~~^{AK} ~9 points to get an
idea of any differences in cross sectional

Kil

6/29

concentration gradient



file 4 is a blank for position 3C

file 5 is 1C blank

file 6 is 1D blank

file 7 is 1A blank

file 8 is 2A blank

file 9 is 3A blank

file 10 is 3D blank

AK

5/19

file 11 - is 2C blank

anemometer flow check

2A - 205

2B - 215-220

2C - 205-210

1A - 200

1B - 200

1C - 196-198

3A - 195-200

3B - 198-200

3C 182-189

file 12 AL 90 min (may stop early)

ethyl benzene in the plate for

cross-sectional conc. difference

t=0 min blank

t=1:40 opened bottle in glove box, poured

t=1:53 pouring done, bottle capped

t=3:05 finally got hands out of gloves

at t=0, inlet in position 2B

AKL

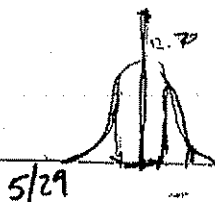
5/19

 $t = 12:00$ moved inlet to 2C $t = 14:00$ moved to 2A $t = 16:00$ moved inlet to 3A $t = 18:00$ inlet to 3B $t = 20:00$ to 3C $t = 22:00$ to 1C

$t = 25:00$ moved to ~~2~~^{AK} 1B
 Note 3 min for 1C
 AK

 $t = 27:00$ inlet to 1A $t = 41:00$ removed inlet from GBTEC

Akil



file 13 5 ml DL of ethyl benzene
in GBTEC w/ 25 scans
per average

file 14 5 ml DL orth. benz. in
GBTEC, 25 scans per ave,
no baseline subtr. (still centroid
data, though)

file 15 orth. benz. by DL
5 scan ave, baseline subtr. OFF

file 16 junk

file 17 begin with sampling the
ethyl benzene in GBTEC
@ 2.0 min, removed inlet from GBTEC
@ 3 minutes, connected inlet
to 5 ppm flowing benzene
the benzene has much less variance, L
the signal

AKel

5/29

file 18 GBTEC sampling while
Dave is using the flow unit
as of a fume hood to mix
(using benzene plate is still in
there, too)

file 19 is continuation of 18,
after some delay

file 20 continues file 19

~~file 2~~

file 21

Dale's test mixture in GBTEC
cap off 38 s
poured by

Neil

6/8

file 22 GBTEC "blank", 2 ml DL

try to do 6/9:

benzene by itself - 1 ml

benzene + toluene - same quantities
as in LW mock test

mock LW (same as 5/29) w/o benzene

6/9

file 1 room air blank w/ sintered stainless
filter at $\sim 50^{\circ}\text{C}$ (warming up)

file 2 same as 1, filter at 60°C

file 3 same, filter $\sim 68^{\circ}\text{C}$

file 4 cyl air blank (2 ml DL) filter at
 $\sim 75^{\circ}\text{C}$ - air @ 0.7 LPM using
regulator, needle valve full
open

AKil

6/19
with AK

file 5 - same as 4

file 6 - same as 4

file 7 5 ppm benzene from cyl. (flow
set to 0.9 LPM w/ needle wide open)
filter at $\sim 88^{\circ}\text{C}$ by now + steady

file 8 is same as 7

file 9 is same

benzene cyl flow (set to 0.3 LPM @ reg.)

time to 500 mL mark 45.69 s

45.66 s

45.81 s

air cyl. set to 1.2

time to 500 mL mark 12.69

12.75

12.62

file 10 ~ 1 ppm benzene

1.086 ppm

AK

~~6/8~~ 6/9 AK

file 11 1.086 ppm

file 12 "

file 13 "

file 14 cyl. blank

file 15 "

file 16 "

benzene cyl. to 0.7

time to 500 mL mark 20.84

20.84

20.79

file 17 benzene 0.7 LPM, air 1.2 LPM

=> 1.893 ppm benzene

file 18 1.893 ppm benzene

file 19 "

tweaked needle valve on benzene

(reg. @ 0.3 LPM) to get $\frac{1}{2}$ lower flow

time to 500 mL mark

159.97

1:58.52 AK

2:00.01

AKil

6/8 6/9 AK

:13
:09

=> 0.477877 ppm

file 20 13 0.4799 ppm

file 21 "

file 22 "

file 23 junk

file 24 GBTEC sampling

while Dale uses it as a fume hood
for mixing

file 25

1 mL benzene in GBTEC

90 min DL file (many stops early)

began data collection w/ capped vial
in glove box

cap off @ 1:47

poured @ 1:51

mass balance
for benzene
looks good!

40 min of data

AKil

~~change~~

6/8 6/9 AK

file 26

cyl. blank

file 27

cyl. blank

file 28

watched GBTEC sampling as
it's used as a hood

file 29 junk

GBTEC sampling, but wanted restart

file 30

benzene (1 mL) + toluene (2.5 mL toluene)

cap off @ 1:47

pour @ 1:51

flow through GBTEC was high for
this run -

measured to be ~~4.3~~

4.3 Spm

@ B2

@ glovebox

AK:il

6/8 6/9 AK

file 31 cyl. air blank
w/o cyl. on Δ

file 32 cyl.
junk

file 33 cyl. air blank

file 34 ethyl benzene + ~~xylenes~~ xylenes ^{AK}
in G/BTEC

first 210 sec are room air

cap off @ 1:47

pour @ 1:51

(same quantities as LW Mock mixture)

file 35 is junk

file ^{30 AK} 35 same mixture as last file (5/29)

LW Mock mixture

open ^{AK} pour @ 1:47

pour @ 1:53

mass balance
for benzene
is low --

108 f³/min

$3.19 \text{ mg/m}^3 = 1 \text{ ppm @ STP}$

AKil

~~6/8~~ 6/9 AK

~~36~~

37 LW Mock w/o benzene
poured @ 2:10

38 2 m. DL 5 ppm benzene
from cyl.

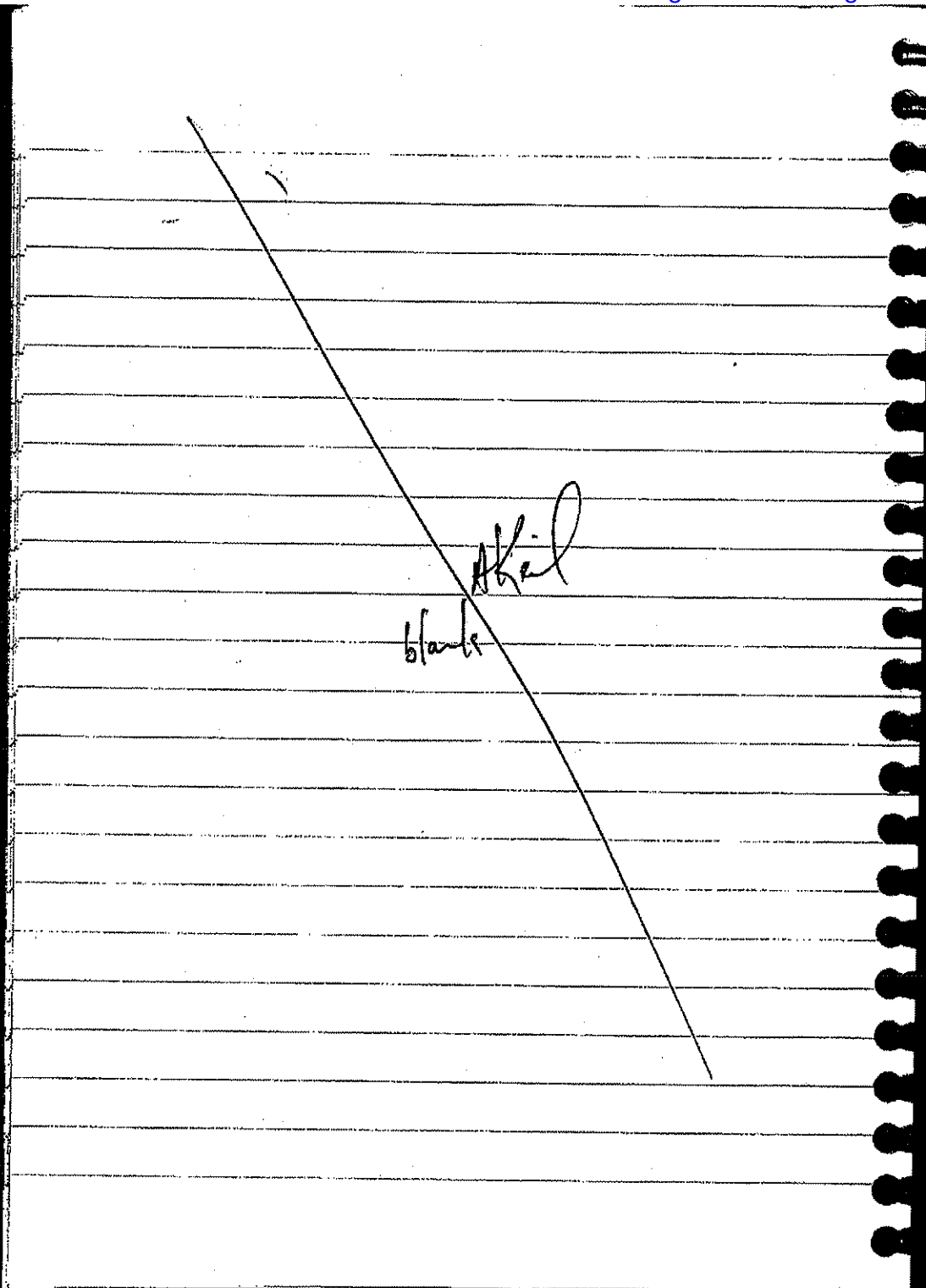
39

"

40

"

AK



6/10

file 1 5ppm benzene

ΔL 2mL

file 2 "

file 3 "

file 4 cyl. air blank

(some leftover benzene signal
at start)

file 5 cyl air blank

clean all the way

file 6 "

these were without shivered stainless
filter hot!

inlet filter at 82°C now

file 7 is 5mL benzene

+ ethyl benzene (7mL) + toluene

in GPTC

m-xylenes (9mL)

cap off @ 1:47

dump @ 1:51

AK

6/10

received ~~25~~[#] 230 ppm ($\pm 2\%$) benzene
cylinder from Angus Group
1000 psi, 103L

file 8 cyl. air blank
(some carry over in first 10 s)

file 9 cyl. air blank
clean

file 10 cyl. air blank

file 11-15 230 ppm benzene
from cyl.

¹⁷⁻²¹
files ~~16-20~~ are 230 ppm benzene
set to 0.3 LPM, air at
1.2 LPM
from yesterday that's $\frac{1.086}{5} \cdot 230 \text{ ppm}$
 $\Rightarrow 49.95 \text{ ppm}$

(file 16 junk)

file 17 or 18 may have carryover...

AKB

13
09

6/10

MS status window at 11:07 AM 6/10

plate voltage 1245

mult bias 1300

files 22-24 cyl. blanks

file 25 room background

file 26 GBTEC background

file 27 20 ml benzene

cap off 1:47

poured 1:51

file 28 room air background

(some carryover in first few seconds)

→ so, ignore

file 29 GBTEC background

file 30 is junk... false start

file 31 is GBTEC, 20 ml benzene

1:47 uncapped

trial 2

1:51 poured

Heit

6/10

file 32 GBTEC sampling for for

file 33 room background 2 min

file 34 GBTEC bkgd sample 2ml

file 35 GBTEC 20 mL benzene
cap off @ 1:47 trial 3
pour @ 1:51

file 36 room air background
some benzene carryover. L
first 10 sec

file 37 GBTEC signal @ elevated
flow

file 38 20 mL benzene w/ higher
flow
uncap @ 1:47
pour @ 1:51

AKF

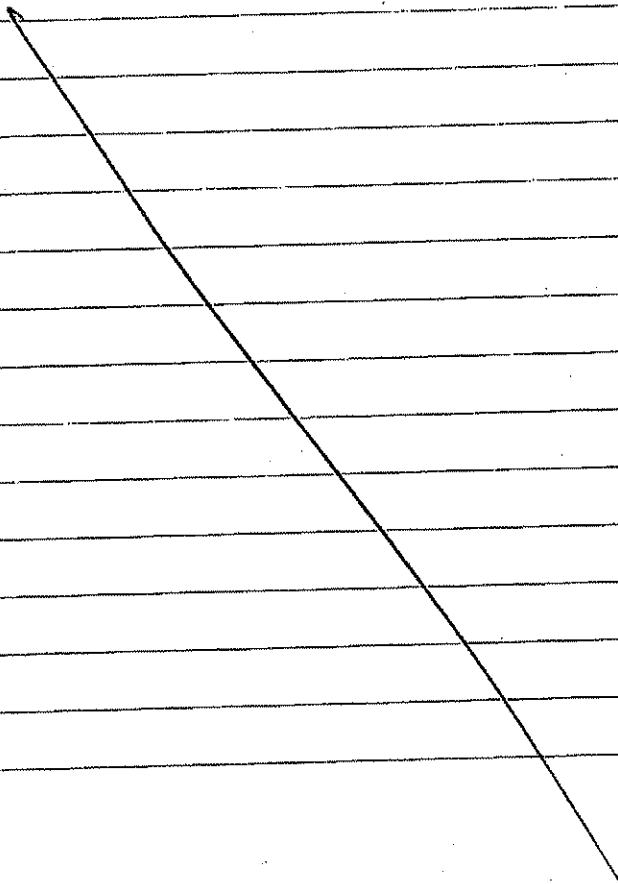
6/10

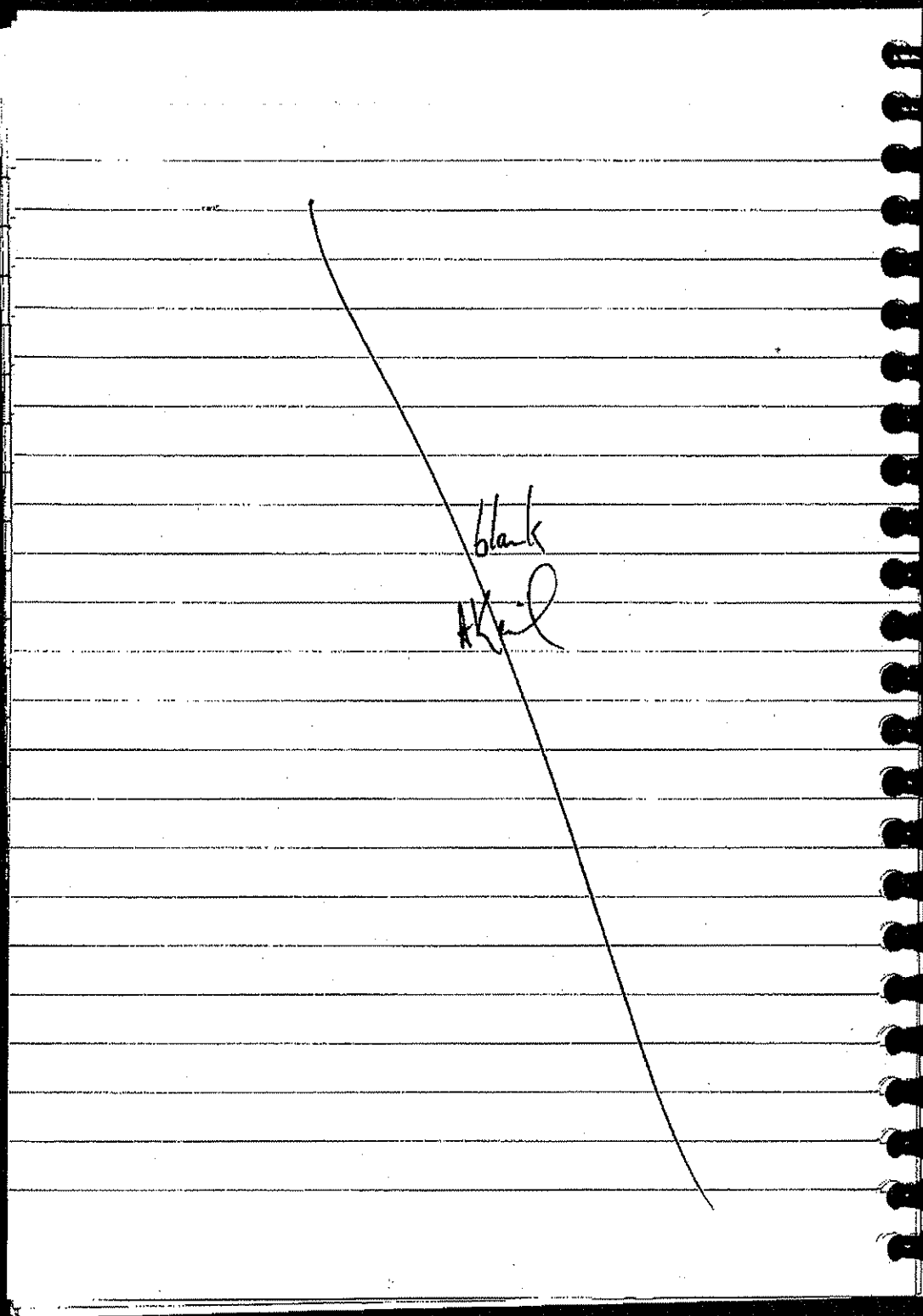
files 39, 40, 41

cyl. air blank

first 0.3 min of file 39 is me
turning on the air - ignore data

AKail





6/11

low m/z tune to start day

files 1-3 cyl. air blanks, 2ml

(ignore 1st ~20s in file 1, leftover
m/z calibrant, etc.)

Ignore file 3 - I turned off air in middle!!

left heat tape on all last night,

so the ss filter is still @ ~95°C

file 4 cyl. air blank

5-7 AK

files 5-8 5ppm benzene
from cylinder

files 8-10 are 49.95 ppm benzene
aka files 17-21 from yesterday
first ~20s of file 8 has some
carryover

files 11-13 are cylinder air
blanks

AKel

6/11

file 14 room air blank

file 13^{15 AK} GBTEC blank

file 16 LW, L GBTEC

20 mL

cap off @ 1:47

pour @ 1:51

file 17 cyl. air blank

file 18

18 ms fixed ionization
time room air blank

file 19

18 ms fixed ion'n time
5 ppm benzene

file 20

18 ms fixed ionization time
30 ppm benzene

F: 72
ms

AKel

6/11

file 21

18 ms room air blank

F = 22 or so

file 22

room air blank, ALC on, the
whole bit

file 23 GBTFC blank

file 24 - junk / restart / false start

file 25 GBTFC run with

LW mixture Trial 2 Flow 25.07 μ g/min
avefile 26 HEADSPACE of residue
from Day 2 Trial 1 glass plate

room air to 0.6 min

0.6 min, inserted inlet into vial
containing ~1 mL of residue

1.2 min, removed inlet

AKel

6/4

file 27 room air blank

file 28 GBTEC blank

file 29

Trial 3 LW mixture

cap off @ 1:51 1:47 AK

poured @ 1:55

file 30

HEADSPACE of Trial 3 residue

room air until 0.6 min,

then headspace until 1.5 min

certainly volatiles present

file 31

5 min of headspace of trial 3
residue

@ room air until 1 min

then headspace vapors until 2.1 min

room air 2.1 min - 3.0 min

headspace 3.0 min - 4.0 min

room air 4.0 min - end

M. Hail

6/11

Conference call w/ ?

Pete Drivas, John, Dale + Me at EPI

Pete discussing the test by so far

benzene, low

evaporation rates - reports $\frac{1}{2}$ lives of
about 3 minutes, that jives well
with his theory

call w/ Dale next week to see

how are new number change Pety's report +

file 32

RAW, detailed data of
residue (Trial 3 w) headspace
however, what's labelled
of zero air in this file isn't -
it's nothing - forgot to turn on
cylinder

file 33 room air blank

file 34 GBTEC blank

it's all

6/11

file 35

1W IL GBTEC

higher flow

-52 spm flow

cap off @ 1:49

pour at 1:56

air velocity ~~26.0~~ spm AK

file 36

GBTEC blank

file 37

1 mL benzene +

19 mL cyclohexane

file 38

SIM on 78, DL, 10 AK, 5 mL

0-2.2 230 ppm

3.6-5.2 5 ppm

5.2-6.6 zero air

6.8-9.2 50 ppm

9.2 - end zero air

AKel

6/11

file 39

alternate between

SIM for 78

and full scan 50-150

GBTEC blank

file 40

3ml benzene

3ml cyclohexane

in GBTEC

using alternating scans

①

file 41

2ml benzene

6ml cyclohexane

in GBTEC

file 42

9ml cyclohexane

1ml benzene

AKal

Blank

Blank

4/12

tune low m/z

file 1 - junk

files 2-4 cyl. air blanks
2 mL DL

files 5-7 5 ppm benzene

files 8-10 are 49.95 ppm
aka file 17 from 6/10

file 11 is junk

file 12

6 mL benzene

3 mL cyclohexane

in GBTEC

file 13 GBTEC run

19.5 mL cyclohexane

0.5 mL benzene

HAL

6/12

so for the benzene/cyclohexane
mixtures, we have:

file 37 6/11 19:1

file 12 6/12 3:6

file 41 6/11 6:2

~~3:5~~

6/10 6:1

GBTEC + uns from 6/10

file 42 6/11 9:1

file 13 6/12 19.5:0.5

Air Veloc. by summary Data so far from Hoke
(ft/min)

Trial	6/10	8/11
	Day 1	Day 2
Trial 1	27.63	28.88
2	26.86	25.07
3	27.50	26.34
4	48.88	51.94

6/12

file 14 room air blank 2L, 2mL

file 15 GBTEC blank

file 16

working w/ liquid wrench
on rusty bolts Trial 1

first pour (only a fraction
of the liquid) at 2:05
all poured out by 4:45
at 20 mL, flask shook the
gears around after having let them
sit for several minutes

file 17 room air blank

file 18 GBTEC blank w/ parts

file 19 Trial 2 - LW on parts

first pour @ 2:05
another pour @ 3:30

file 20 room air blank

file 21 GBTEC blank w/ parts

file 22 LW on parts trial 3.
glove shaking just after
15 min

file 23 room air blank

file 24 GBTEC blank w/ parts

file 25 GBTEC LW w/ parts trial 4
simulation of soaking gloves

Support Document 15

EMSL Plate Glass Residual Oil Analysis

Asbestos • Lead • Environmental • Materials & Indoor Air Analysis

EMSL Analytical, Inc.

<http://www.emsl.com>

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: 8568584571

EMSL

SM

Attn: **Dale Johnson**
Environmental Profiles, Inc.
8805 Columbia 100 Parkway
Suite 100
Columbia, MD 21045

7/6/2009

Phone (410) 744-0700
Fax: (410) 744-2003

The following report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 7/2/2009. The results are tabulated on the attached data pages for the following client designated project:

Project ID: 29125

The reference number for these samples is EMSL Order #010903277. Please use this reference when calling about these samples.

If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:

Julie Smith - Laboratory Director or
other approved signatory
NJ-NELAP Accredited:04653



The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.

**EMSL Analytical, Inc.**

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

EMSL

SM

Attn: **Dale Johnson**
Environmental Profiles, Inc.
8805 Columbia 100 Parkway
Suite 100
Columbia, MD 21045

Customer ID: ENPI53
 Customer PO:
 Received: 07/02/09 11:16 AM
 EMSL Order: 010903277

Fax: (410) 744-2003

Phone: (410) 744-0700

EMSL Proj: 29125

Client Sample Description		Collected:	7/1/2009	Lab ID:	0001
RES-oil-1 Plare Residue day 2, Trial 3					
Method	Parameter	Concentration	Reporting Limit Units	Analysis Date	Analyst
8260B-Volatiles	See Attached		N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.					
Client Sample Description		Collected:	7/1/2009	Lab ID:	0002
RES-oil-2 Plare Residue day 2, Trial 4					
Method	Parameter	Concentration	Reporting Limit Units	Analysis Date	Analyst
8260B-Volatiles	See Attached		N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.					
Client Sample Description		Collected:	7/1/2009	Lab ID:	0003
RES-oil-3 Plate Residue 6152009					
Method	Parameter	Concentration	Reporting Limit Units	Analysis Date	Analyst
8260B-Volatiles	See Attached		N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.					

EPI00152

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

Lab Name: EMSL ANALYTICAL		Customer Sample#:	RES-oil-1		
EMSL Sample ID:	010903277-0001	Project:	29125		
Lab File ID:	V15732.D	Sample Matrix:	Organic		
Instrument ID:	VOA MSD-V	Sampling Date:	7/1/2009		
Analyst:	AF	Analysis Date:	7/2/2009 9:46:00 PM		
GC Column:	RTX-VMS X 30m (0.25 mm)	Level (low/med):	MED		
Sample wt/vol:	1 G	Nominal Amount:	100 µL		
Extract Vol.	10000 (ul)	Aliquot Analyzed:	1 (ul)		
Dilution Factor:	1	Method:	SW846 8260B		
Sample Container:	Jar (SW-846 5035)	Moisture(%)			
Heated Purge (Y/N):	N				

CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	25000		U

Qualifier Definitions
U = Undetected
B = Compound detected in method blank
E = Estimated value
J = Estimated concentration.
D = Dilution

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

Lab Name: EMSL ANALYTICAL		Customer Sample#: RES-oil-2	
EMSL Sample ID: 010903277-0002	Project: 29125		
Lab File ID: V15733.D	Sample Matrix: Organic		
Instrument ID: VOA MSD-V	Sampling Date: 7/1/2009		
Analyst: AF	Analysis Date: 7/2/2009 10:14:00 PM		
GC Column: RTX-VMS X 30m (0.25 mm)	Level (low/med): MED		
Sample wt/vol: 0.720 G	Nominal Amount: 100 µL		
Extract Vol: 10000 (ul)	Aliquot Analyzed: 1 (ul)		
Dilution Factor: 1	Method: SW846 8260B		
Sample Container: Jar (SW-846 5035)	Moisture(%)		
Heated Purge (Y/N): N			

CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	35000		U

Qualifier Definitions
U = Undetected
B = Compound detected in method blank
E = Estimated value
J = Estimated concentration.
D = Dilution

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

Lab Name: EMSL ANALYTICAL		Customer Sample#:	RES-oil-3		
EMSL Sample ID:	010903277-0003	Project:	29125		
Lab File ID:	V15734.D	Sample Matrix:	Organic		
Instrument ID:	VOA MSD-V	Sampling Date:	7/1/2009		
Analyst:	AF	Analysis Date:	7/2/2009 10:41:00 PM		
GC Column:	RTX-VMS X 30m (0.25 mm)	Level (low/med):	MED		
Sample wt/vol:	0.920 G	Nominal Amount:	100 µL		
Extract Vol.	10000 (ul)	Aliquot Analyzed:	1 (ul)		
Dilution Factor:	1	Method:	SW846 8260B		
Sample Container:	Jar (SW-846 5035)	Moisture(%)			
Heated Purge (Y/N):	N				

CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	27000		U

Qualifier Definitions
 U = Undetected
 B = Compound detected in method blank
 E = Estimated value
 J = Estimated concentration.
 D = Dilution



107 Haddon Avenue, Westmont, New Jersey 08108

1-800-220-3675

http://www.emsl.com

010903277

EMSL ANALYTICAL, Inc.

CHAIN OF CUSTODY

EMSL Rep:

09 JUL -2 11:16

Third Party Billing requires written authorization from third party

Your Name:

Dale Johnson

EMSL-Bill to:

Company:

Environmental Profiles, Inc.

Street:

8805 Columbia 100 Parkway

Street:

same address

Box #:

Suite 100

Box #:

City/State:

Columbia, MD Zip 21045

City/State:

Zip

Phone Results to:

Name:

Dale Johnson

Fax Results to:

Telephone #:

410-744-0700

Name:

Dale Johnson

Fax #:

410-744-2003

Project Name/Number:

29125

Purchase Order #:

TURNAROUND TIME

☐ 3 Hours ☐ 6 Hours ☐ 12 Hours ☐ 24 Hours ☒ 48 Hours ☐ 72 Hours ☐ 4 Days ☐ 5 Days ☐ 6-10 Days

SAMPLE MATRIX

☐ Air ☒ Bulk ☐ Soil ☐ Wipe ☐ Micro-Vac ☐ Drinking Water ☐ Wastewater ☐ Chips ☐ Other

ASBESTOS ANALYSIS

PCM - Air

- ☐ NIOSH 7400 (A) Issue 2: August 1994
☐ OSHA w/TWA

TEM AIR

- ☐ AHERA 40 CFR, Part 763 Subpart E
☐ NIOSH 7402 Issue 2
☐ EPA Level II

PLM - Bulk

- ☐ EPA 600/R-93/116
☐ NY Stratified Point Count
☐ California Air Resource Board (CARB) 435
☐ NIOSH 9002

- ☐ PLM NOB (Gravimetric) NYS 198.1

- ☐ EPA Point Count (400 Points)
☐ EPA Point Count (1,000 Points)
☐ Standard Addition Point Count

SOILS

- ☐ EPA Protocol Qualitative
☐ EPA Protocol Quantitative
☐ EMSL MSD 9000 Method fibers/gram
☐ Superfund EPA 540-R097-028 (dust generation)

TEM BULK

- ☐ Drop Mount (Qualitative)
☐ Chatfield SOP-1988-02
☐ TEM NOB (Gravimetric) NY 198.4

TEM MICROVAC

- ☐ ASTM D 5755-95 (Quantitative)

TEM WIPE

- ☐ ASTM D-6480-99
☐ Qualitative

TEM WATER

- ☐ EPA 100.1
☐ EPA 100.2
☐ NYS 198.2

OTHER:

LEAD ANALYSIS

Flame Atomic Absorption

- ☐ Wipe, SW846-7420 ☐ ASTM ☐ non ASTM
☐ Soil, SW846-7420
☐ Air, NIOSH 7082
☐ Chips, SW846-7420 or AOAC 5.009 (974.02)
☐ Wastewater, SW 846-7420
☐ TCLP LEAD SW846-1311/7420

Graphite Furnace Atomic Absorption

- ☐ Air, NIOSH 7105
☐ Wastewater, SW846-7421
☐ Soil, SW846-7421
☐ Drinking Water, EPA 239.2

ICP - Inductively Coupled Plasma

- ☐ Wipe, SW846-6010 ☐ ASTM ☐ non ASTM
☐ Soil, SW846-6010
☐ Air, NIOSH 7300

MATERIALS ANALYSIS

- ☐ Full Particle Identification
☐ Optical Particle Identification
☐ Dust Mites and Insect Fragments
☐ Particle Size & Distribution
☐ Product Comparison
☐ Paint Characterization
☐ Failure Analysis
☐ Corrosion Analysis
☐ Glove Box Containment Study
☐ Petrographic Examination of Concrete
☐ Portland Cement in Workplace Atmospheres (OSHA ID-143)
☐ Man Made Vitrofibers - MMVF's
☐ Synthetic Fiber Identification
☒ Other: Benzene in oil + headspace

MICROBIAL ANALYSIS

Air Samples

- ☐ Mold & Fungi by Air O Cell
☐ Mold & Fungi by Agar Plate count & id
☐ Bacterial Count and Gram Stain
☐ Bacterial Count and Identification

Water Samples

- ☐ Total Coliforms, Fecal Coliforms
☐ Escherichia Coli, Fecal Streptococcus
☐ Legionella
☐ Salmonella
☐ Giardia and Cryptosporidium

Wipe and Bulk Samples

- ☐ Mold & Fungi - Direct Examination
☐ Mold & Fungi - (Culture follow up to direct examination if necessary)
☐ Mold & Fungi - Culture (Count & ID)
☐ Mold & Fungi - Culture (Count only)
☐ Bacterial Count & Gram Stain
☐ Bacterial Count & Identification (3 most prominent types)
☐ Other:

IAQ ANALYSIS

- ☐ Nuisance Dust (NIOSH 0500 & 0600)
☐ Airborne Dust (PM10, TSP)
☐ Silica Analysis by XRD ☐ Niosh 7500
☐ HVAC Efficiency
☐ Carbon Black
☐ Airborne Oil Mist
☐ Other:

Client Sample # (S)

RES-OIL-(1-3) three samples

TOTAL SAMPLE # 3

Relinquished:

Dale Johnson

Date:

7/11/2009

Time:

4:00 pm

Received:

Amy Granam

Date:

7/2/09

Time:

Relinquished:

Received:

Time:

Page 1 of 2

EPI00156

1-800-220-3675

[illegible]

Relinquished:	<u>Dale Johnson</u>	Date:	<u>2/1/2025</u>	Time:	<u>4.00 pm</u>
Received:	_____	Date:	_____	Time:	_____
Relinquished:	_____	Date:	_____	Time:	_____
Received:	_____	Date:	_____	Time:	_____